ORACLE

25 November 1975

MEMORANDUM FOR: TMS-2 Project Manager
SUBJECT : Delivery of Agency Developed Software

1. As of 25 November 1975, the Agency has delivered to [ ] the STATINTL OS/MVT Interface Package and the ASP/V3 Interface Package.

2. The ASP documentation is scheduled for delivery the first part of December 1975. The OS/MVT documentation has been delivered.

3. The following software features and their documentation have not been delivered.
   a. OPEN/CLOSE modification.
   b. Queuing of MSS messages on disk.
   c. Host utility for data set scratches and BLDG's. This work cannot be started until [ ] designs the host-task-to-MSS-task communication protocol. ILLEGIB
   d. Placement of Reader/Interpreter error messages in a job's system message data set for MVT jobs.

4. The features that have not been delivered have not caused any STATINTL delay in [ ] effort to develop the TMS-2 system. Please notify me of any adverse affect on your projected work schedule.

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C/MSB/SED/OJCS

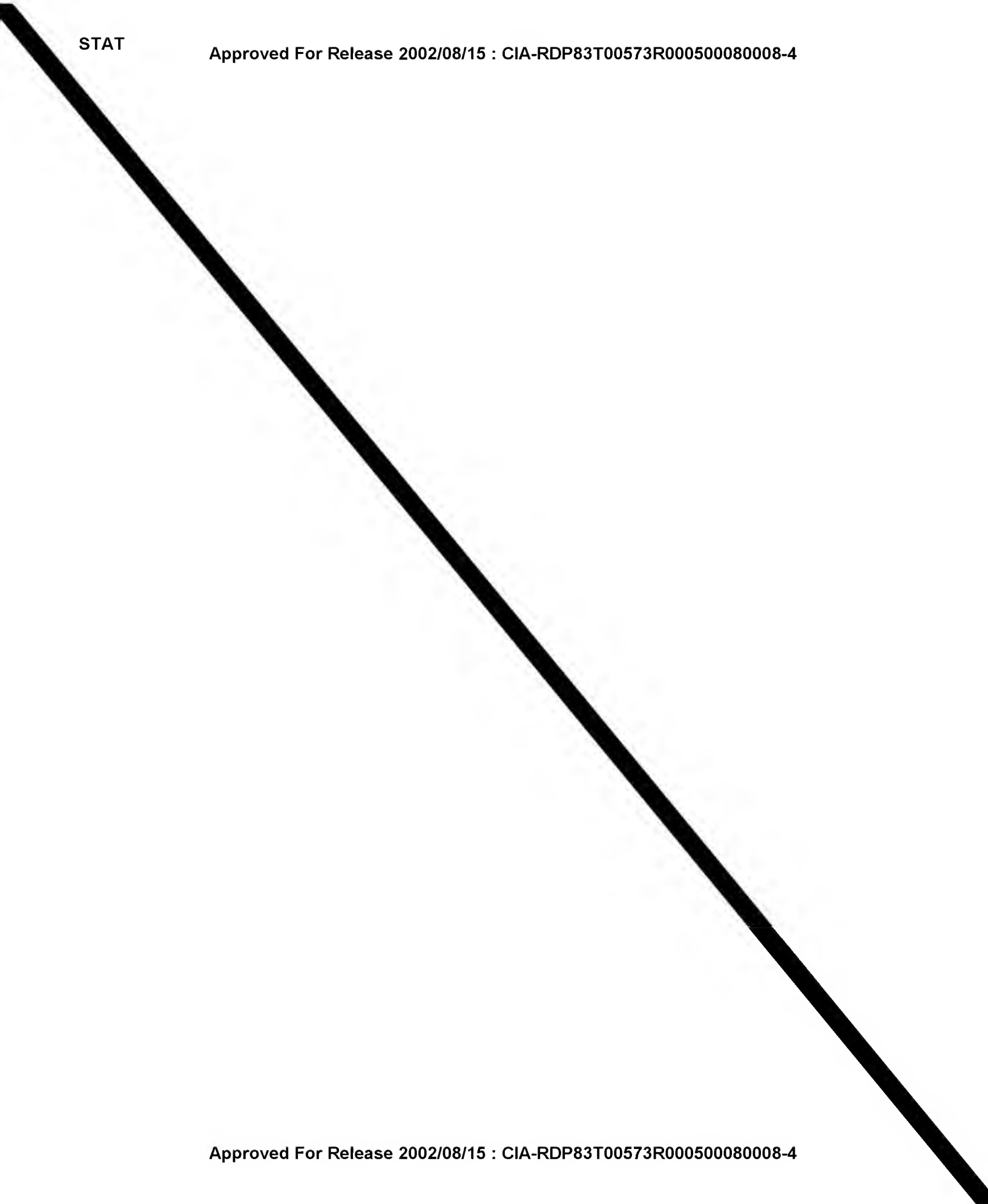
STATINTL
[redacted] Software Management

STATINTL [redacted] relies on two types of working papers to track progress and to plan future tasks of the mass storage software effort. Copies of these papers are submitted to the Agency each month. This type of reporting came about because [redacted] would not have to do any extra paper work, the Agency said it would be satisfied with looking at [redacted] actual working documents. The first report is called the Software Manpower Plan, it shows time in weeks, and each individual programmer and his schedule of tasks to accomplish. Some tasks show a break out of time devoted to subtasks (such as design, code, debug and testing) while many tasks have no breakout. The Plan has proved to be very confusing in that task names are arbitrarily changed from month to month, tasks disappear with no indication as to why, tasks are always being rescheduled, and at this late date the Plan has never shown a complete lists of all tasks needed by the system.

The second report is entitled, "External Function List/Schedule". It contains a summary list of all the system functions and the date when each function is to be completed. We have found by observation that the term complete for this report means that the function has been designed, coded, and debugged at a unit level. Effort required to integrate the function with the rest of the system and test is not specifically shown anywhere. Our problem with this report is that only end dates are shown, there is no way of telling when work begins on a function and how it is progressing.

A further complication is that the two reports are not complementary. There is no sure way to look at tasks shown on the Software Manpower Plan and relate them to the External Function List or vice versa. We found in October STATINTL that [redacted] had reported several Functions as complete when they were not. I feel this error was due to their confusion rather than a deliberate attempt to mislead us.

STATINTL Considering that these reports represent the primary tools used by the [redacted] managers, it is easy to see why they continue to misjudge their progress and have such a difficult time in estimating future events. For purpose STATINTL of illustration some of the major tasks are excerpted to show [redacted] performance and scheduling.



Approved For Release 2002/08/15 : CIA-RDP83T00573R000500080008-4

5 December 1975

Hardware Status - Summary

STATINTL [redacted] declared that in August - "[redacted] hardware STATINTL was placed in a controlled maintenance environment which has already resulted in identification of some problem areas which has been corrected." This statement indicates that the hardware should be complete and needs no further work other than normal maintenance. The reference, [redacted] STATINTL STATINTL [redacted] hardware means the hardware authorized by both contracts [redacted] STATINTL

Reporting for September and October indicate that the hardware is not performing accurately and that extra shift activity started in order to solve the problems. The October report specifically states that additional engineering changes are expected before shipment.

My opinion is that declaration of the maintenance status for the hardware was premature. There is still a high rate of engineering activity being applied. One can conclude that the hardware is not ready for shipment.

The following part of this paper gives more detail and provides specific information about the hardware being procured under the FFP contract [redacted] STATINTL

Status of Hardware on [redacted]

May 1975 Activity Reports

STATINTL [redacted] reporting about the status of hardware indicated that the following hardware modules were complete; DTM1, DTM2, DC1, DC2, TD1, TD2.

The above abbreviations in the report stand for Dual Transport Module (DTM), Data Channel (DC), and Transport Driver (TD).

The Monthly Technical Progress Report for May 1975 made the following statement. "Although the TMS-2 hardware is essentially complete, continual exercise and checkout of the equipment revealed minor discrepancies which require corrective hardware development action."

Although the latter general statement seems to contradict the first, the context of the entire report and the June review meeting left the impression that some of the

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hardware mostly on [redacted] was not yet complete but that the specific items mentioned above were complete.

June 1975 Activity Report

The Monthly Technical Progress Report for June activity states the following:

"Accomplishments for June are as follows:

1. Completion and checkout of the [redacted] funded tape dubbing buffer feature." STATINTL

STATINTL The dubbing buffer is a part of the Data Channel which [redacted] said was complete the previous month. I don't under-
STATINTL stand how it is [redacted] funded

August 1975 Activity Report

The TMS-2 Mass Storage System Progress Summary for August 1975 contained the following statements about hardware.

"Authorized work complete except Systems Concepts
STATINTL channel simulators." The channel simulators are a sub-contract on [redacted]

"Maintenance only status implemented August 4, 1975." These statements imply all hardware is finished on both contracts with the exception of the channel simulators.

The Monthly Technical Progress Report for August activity states:

"Basic development effort on the hardware has been completed with the exception of the rework of the channel simulator to the final physical configuration."

STATINTL [redacted] hardware was placed in a controlled maintenance environment which has already resulted in identification of some problem areas which has been corrected."

One of the problem areas concerned the dubbing buffer a feature of the Data Channel.

"Numerous engineering change upgrades have been made to the DSS hardware, including features to support improved tape loading, reliable vacuum sensing, and removal of certain logic overload conditions."

The Monthly Technical Progress Report for September 1975 activity contains the following statements:

"Sustaining activities on the basic development hardware

continue with special emphasis on upgrading all hardware to incorporate the latest Engineering changes."

"Planned system testing at [redacted] under the maintenance only environment identified some additional problem areas consistent with our plan to "wring out" the hardware in a test environment." STAT

"During early September, System testing in [redacted] indicated a high rate of CCS data accuracy problems. The error source was found to reside in the TBM Data Channel, specifically, Module P. Corrections have been implemented on both Data Channels and preliminary analysis indicates the problem has been solved." STATINTL

"Extensive DSS data accuracy testing has been performed and several problems were found in which System performance varied from day to day."

The Mass Storage System Progress Summary states: "Authorized work complete except Systems Concepts Channel Simulators."

October 1975 Activity Reports

The TMS2 Hardware Development Section of the monthly Technical Progress Report for October Activity states:

"A graveyard shift was implemented in order to provide sufficient hardware reliability for Tape Dubbing Buffer debug."

"DSS Engineering Changes: up-to-date. Additional incorporations expected before shipment."

All of the above excerpts give the impression that the hardware is "complete" except there is considerable "corrective hardware development action." This level of activity is unusual for equipment that has been placed in a "maintenance only status." It is clear that the total hardware configuration is not complete since [redacted] points out that the Dubbing Buffer is still in "debug" status. STATINTL

Tally Track

The rest of this paper on [redacted] hardware follows the Tally Track feature which [redacted] software personnel and the TMS-2 project manager personally reported as incomplete in mid-November. The Tally Track feature is part of the Transport Driver.

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Reporting for May activity shows that future activity is planned for a task entitled, "Tally Track Support." Work is planned to start the last week in June 1975 and continue through the third week in July 1975.

The software section of the above referenced report indicates the software group cannot proceed any further with its Tally Track effort until the hardware is ready.

Reporting for August activity states that - "All Tally Track Commands at the TDP level have been activated and tested." The TMS2 Hardware Schedule shows the Tally Track Support task stopping as scheduled at the end of the third week of July. When it is remembered that elsewhere in the report, we are told the hardware has been placed in a maintenance only status there is no reason to believe this particular hardware module (Transport Driver) is not complete.

Reporting for September activity states that - "Additional features with regard to tally track error conditions have been identified as required. Code and debug is scheduled for the month of November."

It is clear that the Transport Driver is not complete because the tally track logic is still being worked. Accordingly the software group has continually slipped its schedule for Tally Track software, evidently waiting for the hardware to be completed.

Reporting for October activity states that - "Additional features with regard to tally track error conditions have been identified as required."

It can be seen that the tally track task is still active and being reported on. Thus, the Transport Driver is not complete because of the tally track feature which is another reason for not being able to ship the hardware as scheduled.

4 December 1975

Contract Milestones

STATINTL [redacted] Preshipment Acceptance Test (PSAT)

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STATINTL Amendment five of [redacted] stated that the [redacted] PSAT would be held in September 1975. During
STATINTL the last week of August, [redacted] informally notified the Agency that they would like to delay the test until mid-November 1975. The Agency was notified in writing of this slippage via the monthly progress packet which was submitted the first week in September. The reason given for this delay was simply that [redacted] was not yet ready for STATINTL
the test. This in spite of their claim in [redacted] letter STATINTL
TMS-2/041 dated 3 July 1975 that all of the software functions to be tested were already complete.

STATINTL The PSAT was held as scheduled in mid-November. [redacted] failed to pass it. There were serious hardware problems and many software deficiencies. In view of the many basic system failures, it was obvious that the system was not ready for testing. [redacted] personnel admitted they STATINTL
STATINTL were not ready for the test. The day before the test was to start, the [redacted] project manager asked that the test
STATINTL not be called PSAT and instead it be treated as a joint exercise by [redacted] and the Agency to determine the status
STATINTL of the system. This offer was turned down and it was left to [redacted] to again reschedule the test or to continue as
STATINTL scheduled. [redacted] chose to continue knowing full well the PSAT would fail. Afterwards they said that they could not by themselves generate the discipline necessary to test their system. It should be noted that [redacted] established STATINTL
an Integration and Test Group in September for this very purpose.

STATINTL The [redacted] PSAT is concerned with the testing of the basic system functions. Essentially it determines if a set of files can be transferred between the mass storage media (tape) and disks. In addition to the transfer of files, other functions such as recording the files status and locations are tested. If the test had been completed successfully, it would have proved that the mass storage system

can provide a minimum capability in a laboratory-like environment. The failure of the test reveals a low level of competency on the part of [redacted] and also a low probability that the system will ever be successfully completed. This last statement should be considered in view of the fact that [redacted] has already spent a total of two years and five months on the project.

The original schedule of the [redacted] PSAT in September indicates that in June 1975, [redacted] management was unaware of the status of its mass storage system, from the view of both hardware and software. Three weeks before the September test was to start, [redacted] rescheduled the test to start in mid-November. It is apparent that when this delay in the schedule was introduced, again [redacted] did not know the system status and made a poor estimate of when they would be ready.

Events have proven that in June 1975 [redacted] could not predict the state of the mass storage system just three months in advance. Then in August with the benefit of additional time [redacted] was still unable to correctly project a schedule for the same event.

STATINTL [redacted] Preshipment Acceptance Test

STATINTL The [redacted] PSAT was originally scheduled for October 1975. In September the test was rescheduled to December 1975. In November the test was tentatively scheduled for
STATINTL February or March 1976. [redacted] is expected to give a more definitive schedule at the next review meeting which will
STATINTL be 11 December 1975.

STATINTL The [redacted] PSAT cannot be held until the [redacted] STATINTL
[redacted] PSAT has been successful. The description of the
STATINTL [redacted] PSAT in contract [redacted] states that the recovery STATINTL
function will be tested. The current schedule predicts
STATINTL the last recovery function will be complete in April, therefore if [redacted] performs even as they predict, the PSAT cannot possibly start before May 1976.

STATINTL The [redacted] PSAT will test the hardware that [redacted] STATINTL expects to ship to headquarters and also the system function. At this date we have not yet submitted a test plan to [redacted] STATINTL

Hardware Shipment

The shipment of the mass storage hardware to headquarters was originally scheduled for November 1975. In August 1975 this schedule was changed to January 1976. In October 1975 the schedule was changed again to March 1976. When [redacted] STATINTL made these revisions to the shipping schedule the Agency did not argue against them. Our reasoning was that the presence of the hardware on the [redacted] was necessary STAT for the success of the software development effort. There has never been any indication by [redacted] that shipment would STATINTL
STATINTL have to be delayed because of problems with the hardware. We were told by [redacted] personnel at the [redacted] PSAT STATINTL that the hardware is not complete. The tally track feature has not yet been successfully incorporated.

The hardware cannot be shipped until the [redacted] STATINTL PSAT has been successful.

Software Installation, Initial

The initial software was scheduled for installation at Headquarters in November 1975. This schedule was made in June 1975, three months later in September 1975 this STATINTL event was rescheduled by [redacted] from November 1975 to January 1976. In October the event was again rescheduled, this time from January 1976 to April 1976 for an overall slip of five months. The initial software cannot be installed before the hardware is shipped.

Software Installation, Final

The final software was initially scheduled for installation at Headquarters in March 1976. This schedule was made in June 1975, three months later in September 1975 this event was rescheduled by [redacted] from March to June 1976. STATINTL

Final Acceptance Test (FAT)

In June 1975, the Final Acceptance Test (FAT) was scheduled to begin in mid April 1976 and end the first week in June 1976. In October 1975, the FAT was rescheduled to begin in mid-July and end in mid-August 1976. This represents a slippage of three months and a reduction in the duration of the FAT of two weeks. This new schedule is simply an arbitrary decision on the part of [redacted] management. The STATINTL schedule is not realistic, the [redacted] project manager has STATINTL privately admitted that it is not. He says that top [redacted] STATINTL management will not listen to bad news.

The schedule for the FAT does not make sense at all. STATINTL [redacted] own schedules for individual tasks show the last ones will be finished in June, they then allow two weeks for system testing to prepare for the FAT which starts in July. It is normal for systems of the level of complexity of the mass storage system to take six months of testing to prepare STATINTL for an acceptance test. [redacted] own experience with the STATINTL [redacted] PSAT showed that after three months of preparation, the system was still defective and could not perform acceptably. The reader should be reminded that the PSAT involved a much simpler system than the one scheduled for FAT.

STATINTL In summary, [redacted] can start the FAT as scheduled just as they started the [redacted] PSAT on schedule STATINTL but their current prediction guarantees failure.

Final Publication

The scheduled date for delivery of the final publications is August 1976. There has been no revision of this schedule. The documentation must be complete before the Final Acceptance Test can be conducted.

Oracle File

STATINTL

[redacted]

1. You are herewith advised that the Government considers that performance by [redacted] under Contract STATINTL [redacted] is unsatisfactory and not in accordance with Contract performance requirements. Specific items of concern which indicate failure to make adequate progress or to perform in such a manner as to indicate any likelihood of successful completion of the Contracts within the required timeframe include the following:

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a. The first item concerns your failure to pass the [redacted] Preshipment Acceptance Test (PSAT) held during the period from 19 November 1975 to 25 November 1975. We are taking this opportunity to officially advise you of this failure. The Government considers the PSAT failure to be of such significance that the probability of your successful completion of the TMS-2 Program within the contractually required timeframe is extremely low. While the nature of some of the individual failures were not too significant from an overall program viewpoint, these failures are significant in that they have occurred after more than two years of development effort. The general pattern of failures of both hardware and software when combined with two especially serious types of failures establishes the fact you are failing to make adequate progress so as to endanger performance under the aforementioned Contracts.

These two serious failures are the inability of the Mass Storage System to move some files from disk to TBM tape and the inability of the system to move some files from the TBM tape to disk. The specification and the system design assume the latter problem will occur once for each 3.75 billion characters of data. The test results showed a rate of 25 occurrances for each 3.75 billion characters. IT IS ESTIMATED THAT THIS ERROR RATE WOULD RESULT IN A LOSS OF AT LEAST 70 FILES EVERY DAY ON OUR CURRENT SYSTEM ENVIRONMENT.

b. The Government is also concerned over a series of problems that were discovered at the October Management Review Meeting. Our greatest concern is that the current design appears to deviate from the contract specifications. These problems are summarized below:

There is an inability to concurrently access individual Transport Drivers from both Storage Control Processors;

The stated maximum hardware configuration of 6 Transport Drivers, 64 Tape Transports, 3 Data Channels, and 6 External Data Channel Processors does not have a "perfect switching" capability;

A Storage Control Processor requires a dedicated disk controller to access the Mass Storage System's private files;

Functions are ~~no~~ not split and/or shared between the two Storage Control Processors.

c. Another area of concern is your apparent inability to judge the extent of your accomplishments and to estimate future schedules. The original September 1975 date for the [redacted] PSAT indicated that in June 1975, just three months prior to the event, [redacted] management was unaware of the status of its mass storage system from the view of both hardware and software. Three weeks before the September test was to start, [redacted] rescheduled the test to start in mid-November. Although the test was held in accordance with [redacted] revised schedule, the system was not ready for testing. Events have proven that in June 1975 [redacted] could not predict

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what the state of the system would be just three months later. Then in August with the benefit of additional time STATINTL was still unable to correctly project a realistic schedule for the same events. Because of your record in scheduling, the Government now has serious doubts about the validity of your overall schedule projections.

2. While this communication should not be construed as a formal cure notice in accordance with the termination provisions of the aforementioned Contracts, ~~but~~ you are hereby put on notice that such action is seriously being considered by the Government. In view of the magnitude of the problems discussed herein, the Government considers that the routine monthly management meeting presently scheduled for 11 December 1975 is inappropriate. Instead, STATINTL management should be prepared to discuss the current status of the TMS-2 Project in terms of this message. Contractor representatives should be prepared to discuss their failure to make progress in the prosecution of the work under the Contracts such that performance is endangered, the reasons for their failure to make adequate progress, and any possible plans for correcting such failure.

3. The Government proposes that a meeting with STATINTL be held at its Washington, D. C., location as soon as possible but no later than 18 December 1975 to discuss this matter. Please contact STATINTL to establish the date and time for our meeting.

STATINTL

Contracting Officer

Releasing Official

Harry J. Fitzwater
Director of Joint
Computer Support

Termination for Default